

Claims

- [c1] Claim 1: A CMOS register circuit having a plurality of n-channel MOSFET transistors and a plurality of p-channel MOSFET transistors, accepting an input data, and a clock signal, and providing an output data, said clock signal being a charge recycled clock signal having a stepwise waveform from a switched capacitor regenerator or sine waveform from an LC resonant circuit in which power supplied to a load is at least partially collected to said switched capacitor regenerator or said LC resonant circuit, and the following inequality is satisfied;

$$\left| V_{TN} \right| + \left| V_{TP} \right| \geq VDD$$

where V_{TN} is threshold of said n-channel MOSFET transistor, V_{TP} is threshold of said p-channel MOSFET, and VDD is output voltage of said switched capacitor regenerator or said LC resonator circuit,

wherein said register circuit comprises a pair of D-latch circuits with an input of a second D-latch circuit coupled with an output of a first D-latch circuit, a first D-latch circuit accepts a first power clock signal, and a second

D-latch circuit accepts a second power clock signal which is different by 180° phase of the first power clock signal.

[c2] Claim 2 : A register circuit according to claim 1, wherein said D-latch circuit comprises a pair of NOR circuits with one of the inputs of each NOR circuit being coupled with an output of the other NOR circuit, and a pair of AND circuits each accepting an input data in differential form and a power clock signal, and providing an output to the other input of each of said NOR circuit.

[c3] Claim 3: A register circuit according to claim 1, wherein said D-latch circuit comprises a memory element having a first inverter providing an output of the D-latch circuit, a second inverter with an input coupled with an output of said first inverter, and a first transmission gate connecting an output of the second inverter to an input of the first inverter, and a second transmission gate inserted between an input terminal and an input of said first inverter.